

REMARKS

Withdrawn claims 87-90 are amended herein, as indicated in the listing of claims by the status identifier “Withdrawn-currently amended.” Applicants note that subsection C(E) of M.P.E.P. § 714 lists the status identifier “Withdrawn-currently amended” as an acceptable alternative for “Withdrawn.” As such, use of “Withdrawn-currently amended” to indicate the amendments to claims 87-90 complies with the current rules of the United States Patent and Trademark Office.

Claims 35, 39, 57, 59, 60, 63, 70, 71, and 87-90 have been amended. New claims 94-114 have been added. Support for the new claims is found at at least paragraphs [0004], [0021], [0025], and [0034] of the as-filed specification. No new matter has been added.

The Final Office Action mailed November 17, 2006, has been received and reviewed. Claims 1-16 and 18-90 are currently pending in the application. Claims 1-16, 18-28, and 31-82 stand rejected. Claims 29, 30, and 83-90 are withdrawn. Applicants have amended claims 35, 39, 57, 59, 60, 63, 70, 71, and 87-90, canceled claims 6 and 68, added new claims 94-114, and respectfully request reconsideration of the application as amended herein.

Election of Species

Applicants appreciate the indication that the restriction of claims 26-28 and 31-56 is withdrawn. However, as described in Applicants' previous responses, Applicants also respectfully request withdrawal of the Election of Species Requirement regarding claims 29, 30, and 83-90. Claims 29, 30, and 83-90 are allowable, *inter alia*, as depending from an allowable base claim. Furthermore, Applicants note that the subject matter of claims 29 and 30 has already been considered by the Examiner because substantially similar subject matter is recited in claims 66 and 67, which are under consideration. Applicants also note that the subject matter of claims 83-90 has already been considered by the Examiner because substantially similar subject matter is recited in claims 81 and 82, which are under consideration.

Therefore, the Election of Species Requirement regarding claims 29, 30, and 83-90 should be withdrawn. As a result, claims 1-16 and 18-90 should be under consideration.

35 U.S.C. § 102(b) Anticipation Rejections

Anticipation Rejection Based on Drakin

Claims 1-10, 13, 14, 18, 23-25, and 57 stand rejected under 35 U.S.C. § 102(b) as being anticipated by Drakin. Claim 6 has been canceled, rendering moot the rejection as to this claim. Applicants respectfully traverse this rejection as to the remaining claims, as hereinafter set forth.

A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference. *Verdegaal Brothers v. Union Oil Co. of California*, 2 U.S.P.Q.2d 1051, 1053 (Fed. Cir. 1987). The identical invention must be shown in as complete detail as is contained in the claim. *Richardson v. Suzuki Motor Co.*, 9 U.S.P.Q.2d 1913, 1920 (Fed. Cir. 1989).

Drakin discloses a device for extinguishing a fire that includes a pyrotechnic composition. Drakin at column 1, lines 5-10. Upon ignition, the pyrotechnic composition produces a gas and aerosol mixture that includes hydrogen, oxygen, ammonia, and carbon-containing gases, such as carbon monoxide (“CO”) and methane (“CH₄”). *Id.* at column 4, lines 1-21 and Table 1. The pyrotechnic compositions include carbon-containing ingredients, such as dicyaneamide, phenol formaldehyde resins, epoxy resins, and ballistite powder (nitrocellulose and nitroglycerin). *Id.* at Table 1. The gas and aerosol mixture is passed through an oxygen-containing oxidizer, which decomposes to oxygen. *Id.* The oxygen reacts with the gas and aerosol mixture and incompletely oxidized combustion products to produce carbon dioxide (“CO₂”), water (“H₂O”), and nitrogen (“N₂”). *Id.* The gas and aerosol mixture is cooled using a solid coolant. *Id.* at column 4, lines 31-32.

Drakin does not anticipate claim 1 because Drakin does not expressly or inherently describe the element of “a gas generant formulated to pyrotechnically produce an inert gas mixture substantially free of carbon-containing gases.” The Examiner asserts that Drakin discloses this element but provides no support for this assertion. Applicants respectfully submit that the pyrotechnic compositions disclosed in Drakin produce carbon-containing gases when combusted because the pyrotechnic compositions include ingredients that contain carbon. Specifically, the reactions at column 4, lines 1-21 of Drakin indicate that CO and CH₄ are combustion products of the pyrotechnic compositions. As such, the pyrotechnic compositions of

Drakin are not “formulated to pyrotechnically produce an inert gas mixture substantially free of carbon-containing gases,” as recited in claim 1.

Since Drakin does not expressly or inherently describe each and every element of claim 1, the anticipation rejection is improper and should be withdrawn.

Claims 2-10, 13, 14, 18, and 23-25 are allowable, *inter alia*, as depending from an allowable base claim.

Claim 5 is further allowable because Drakin does not expressly or inherently describe that the gas generant is formulated to produce minimal amounts of carbon monoxide, particulates, or smoke when combusted.

Claim 7 is further allowable because Drakin does not expressly or inherently describe that the gas generant is formulated to produce less than 1 percent of an original weight of the gas generant in particulates or smoke.

Claim 8 is further allowable because Drakin does not expressly or inherently describe that substantially all of the at least one gaseous combustion product forms the inert gas mixture.

Claim 9 is further allowable because Drakin does not expressly or inherently describe that the at least one solid combustion product is formulated to minimize production of particulates during combustion of the gas generant.

Claim 10 is further allowable because Drakin does not expressly or inherently describe that the at least one solid combustion product is a slag.

Claim 13 is further allowable because Drakin does not expressly or inherently describe that the gas generant is formed into a geometry that provides a neutral burn when combusted.

As amended, claim 57 recites, *inter alia*, the element of “igniting a gas generant to produce an inert gas mixture substantially free of carbon-containing gases.” Since this element is similar to the element discussed above in regard to claim 1, claim 57 is allowable for substantially the same reasons as claim 1.

35 U.S.C. § 103(a) Obviousness Rejections

Obviousness Rejection Based on Drakin in view of U.S. Patent No. 6,474,684 to Ludwig *et al.*

Claim 11 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Drakin in view of U.S. Patent No. 6,474,684 to Ludwig *et al.* (“Ludwig”). Applicants respectfully traverse this rejection, as hereinafter set forth.

M.P.E.P. 706.02(j) sets forth the standard for an obviousness rejection:

To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on applicant’s disclosure. *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991).

Claim 11 is allowable, *inter alia*, as depending from an allowable base claim.

Specifically, claim 11 is allowable because Drakin and Ludwig, when combined, do not teach or suggest the limitation of “a gas generant formulated to pyrotechnically produce an inert gas mixture substantially free of carbon-containing gases.” Since claim 11 depends from claim 1, claim 11 includes the above-mentioned limitation of claim 1. Ludwig does not cure the above-mentioned deficiencies in Drakin and, therefore, does not teach or suggest the above-mentioned limitation.

Since the cited references do not teach or suggest all of limitations of claim 11, the obviousness rejection is improper and should be withdrawn.

Obviousness Rejection Based on Drakin in view of U.S. Patent No. 6,093,269 to Lundstrom *et al.*

Claim 12 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Drakin in view of U.S. Patent No. 6,093,269 to Lundstrom *et al.* (“Lundstrom”). Applicants respectfully traverse this rejection, as hereinafter set forth.

Claim 12 is allowable, *inter alia*, as depending from an allowable base claim.

Specifically, claim 12 is allowable because Drakin and Lundstrom, when combined, do not teach or suggest all of the limitations of claim 12. Since claim 12 depends from claim 1, claim 12 includes all of the limitations of claim 1. However, Lundstrom does not cure the above-mentioned deficiencies in Drakin and, therefore, does not teach or suggest the limitation of “a gas generant formulated to pyrotechnically produce an inert gas mixture substantially free of carbon-containing gases.”

Since the cited references do not teach or suggest all of limitations of claim 12, the obviousness rejection is improper and should be withdrawn.

Obviousness Rejection Based on Drakin in view of U.S. Patent No. 5,538,568 to Taylor *et al.* and U.S. Patent No. 5,882,036 to Moore *et al.*

Claim 15 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Drakin in view of U.S. Patent No. 5,538,568 to Taylor *et al.* (“Taylor”) and U.S. Patent No. 5,882,036 to Moore *et al.* (“Moore”). Applicants respectfully traverse this rejection, as hereinafter set forth.

Taylor teaches a hybrid gas generating system that includes an extrudable gas generant having an oxidizer and a thermosettable resin. Taylor at column 1, lines 12-17 and column 2, lines 56-67. The thermosettable resin is an acrylate-terminated polybutadiene, a hydroxy-terminated polybutadiene/diisocyanate reaction product, an ester of a polybutadiene polycarboxylic acid and an epoxy modified polybutadiene and/or a hydroxyl-terminated polybutadiene, and a styrene/polyester copolymer. *Id.* at column 3, lines 17-28. CO₂ and H₂O are produced upon combustion. *Id.* at column 5, lines 42-45. The gas generant also includes titanium dioxide and cupric oxide. *Id.* at column 5, lines 57-60 and column 6, lines 8-11.

Moore teaches an inflator that includes a gas generant. Moore at the Abstract. The gas generant includes hexa amminecobalt(III) trinitrate (“HACN”), basic copper nitrate, and guar gum or HACN, basic copper nitrate, guanidine nitrate, and guar gum. *Id.* at column 6, lines 23-36.

Claim 15 is allowable, *inter alia*, as depending from an allowable base claim.

Specifically, claim 15 is allowable because the cited references, when combined, do not teach or

suggest all of the claim limitations. Since claim 15 depends from claim 1, claim 15 includes all of the limitations of claim 1. However, Taylor and Moore do not cure the above-mentioned deficiencies in Drakin and, therefore, do not teach or suggest the limitation of “a gas generant formulated to pyrotechnically produce an inert gas mixture substantially free of carbon-containing gases.” As taught in Taylor, the gas generant produces CO₂ when combusted. Similarly, since the gas generant of Moore includes guar gum (a carbon-containing compound), the gas generant produces carbon-containing gases when combusted.

In addition, there is no motivation to combine to produce the claimed invention. To provide a motivation or suggestion to combine, the prior art or the knowledge of a person of ordinary skill in the art must “suggest the desirability of the combination” or provide “an objective reason to combine the teachings of the references.” M.P.E.P. § 2143.01. The mere fact that references can be combined or modified does not render the resultant combination obvious unless the prior art also suggests the desirability of the combination. *Id.* (emphasis in original).

The Examiner states that “[i]t would have been obvious to one having ordinary skill in the art at the time the invention was made to have made the gas generant of Drakin comprising a combination of the elements as taught by Taylor et al. and Moore et al. since Taylor et al. and Moore et al. teach such elements for forming a gas generant are known in the art and the combination of these elements would properly form a gas generant.” Office Action of November 17, 2006, p. 3. The Examiner’s statement suggests that the claimed invention is obvious merely because the individual elements are known in the art. However, a “statement that modifications of the prior art to meet the claimed invention would have been ‘well within the ordinary skill of the art at the time the claimed invention was made’ because the references relied upon teach that all aspects of the claimed invention were individually known in the art is not sufficient to establish a *prima facie* case of obviousness without some objective reason to combine the teachings of the references.” M.P.E.P. § 2143.01. The Examiner’s alleged motivation to combine is conclusory and is not an objective reason that supports combination of the cited references because nothing in Drakin, Taylor, or Moore, alone or in combination, suggests the desirability of, or provides an objective reason for, selecting and combining various ingredients from their respective compositions to produce the claimed invention.

Since the cited references do not teach or suggest all of the claim limitations and do not provide a motivation to combine to produce the claimed invention, the obviousness rejection of claim 15 is improper and should be withdrawn.

Obviousness Rejection Based on Drakin in view of Taylor and United States Patent No. 6,481,746 to Hinshaw *et al.*

Claim 16 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Drakin in view of Taylor and United States Patent No. 6,481,746 to Hinshaw *et al.* ("Hinshaw"). Applicants respectfully traverse this rejection, as hereinafter set forth.

Hinshaw teaches a gas generating composition that includes a metal complex, such as HACN and polyacrylamide. Hinshaw at column 3, lines 51-59 and column 7, line 62 through column 8, line 7.

Claim 16 is allowable because the cited references do not provide a motivation to combine to produce the claimed invention. The Examiner states that "[i]t would have been obvious to one having ordinary skill in the art at the time the invention was made to have made the gas generant of Drakin comprising a combination of the elements as taught by Taylor *et al.* and Hinshaw *et al.* since Taylor *et al.* and Hinshaw *et al.* teach such elements for forming a gas generant are known in the art and the combination of these elements would properly form a gas generant." Office Action of November 17, 2006, p. 4. The Examiner's alleged motivation to combine suggests that the claimed invention is obvious merely because the individual elements are known in the art. However, the Examiner's statement is conclusory and is not an objective reason that supports combination of the cited references. Furthermore, nothing in Drakin, Taylor, or Hinshaw, alone or in combination, suggests the desirability of, or provides an objective reason for, selecting and combining various ingredients from their respective compositions to produce the claimed invention.

Since the cited references do not provide a motivation to combine to produce the claimed invention, the obviousness rejection of claim 16 is improper and should be withdrawn.

Obviousness Rejection Based on Drakin in view of U.S. Patent No. 5,739,460 to Knowlton *et al.*

Claims 19-21 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Drakin in view of U.S. Patent No. 5,739,460 to Knowlton *et al.* (“Knowlton”). Applicants respectfully traverse this rejection, as hereinafter set forth.

Knowlton teaches an autoignition composition used to ignite a gas generator composition. Knowlton at the Abstract. The autoignition composition includes an oxidizer and a powdered metal. *Id.* at column 2, lines 44-55. The oxidizer includes lithium nitrate, sodium nitrate, or potassium nitrate. *Id.*

Claims 19-21 are allowable, *inter alia*, as depending from an allowable base claim.

In addition, the cited references do not teach or suggest all of the limitations of claim 19-21 because neither reference teaches or suggest a heat management system that comprises a phase change material (claim 19). Since the cited references do not teach or suggest a phase change material, the cited references necessarily do not teach or suggest that the phase change material in the heat management system comprises lithium nitrate, sodium nitrate, potassium nitrate, or mixtures thereof (claim 20) or that the fire suppression system is configured to transfer heat from the inert gas mixture to the phase change material (claim 21).

While Knowlton teaches lithium nitrate, sodium nitrate, or potassium nitrate, Knowlton teaches that these components are present in an autoignition composition. Therefore, contrary to the Examiner’s assertion, Knowlton does not teach or suggest that these components are present in a “heat management system positioned and configured to reduce a temperature of the inert gas mixture,” as recited in claim 1, upon which claims 19-21 directly or indirectly depend. Rather, the autoignition composition produces heat to initiate combustion of the gas generator composition of Knowlton.

The cited references also do not provide a motivation to combine to produce the claimed invention. The Examiner states that “[i]t would have been obvious to one having ordinary skill in the art at the time the invention was made to have included into the gas generant of Drakin a phase change material comprising the various nitrates as recited in order to manage the heat.” Office Action of November 17, 2006, p. 4. However, even if the cited references were combined in the manner asserted by the Examiner, the claimed invention would not be produced because

the resulting combination would be a gas generant having lithium nitrate, sodium nitrate, or potassium nitrate. The combination would not produce a heat management system comprising a phase change material (as recited in claim 19) positioned and configured to reduce a temperature of the inert gas mixture, lithium nitrate, sodium nitrate, potassium nitrate, or mixtures thereof as the phase change material (as recited in claim 20), or the fire suppression system configured to transfer heat from the inert gas mixture to the phase change material (claim 21).

Obviousness Rejection Based on Drakin

Claim 22 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Drakin. Applicants respectfully traverse this rejection, as hereinafter set forth.

Claim 22 is allowable, *inter alia*, as depending from an allowable base claim. Claim 22 is further allowable because Drakin does not teach or suggest that the fire suppression system is configured to disperse the inert gas mixture therefrom within from approximately 20 seconds to approximately 60 seconds after ignition of the gas generant.

Obviousness Rejection Based on Drakin

Claims 26-28, 31-42, 45, 48, 49, and 53-56 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Drakin. Applicants respectfully traverse this rejection, as hereinafter set forth.

Dependent claims 26-28, 31-42, 45, 48, 49, and 53-56 are allowable, *inter alia*, as depending from an allowable base claim.

Claim 31 is further allowable because Drakin does not teach or suggest that the igniter composition is formulated to produce solid combustion products when combusted.

Claim 33 is further allowable because Drakin does not teach or suggest that the at least one pellet further comprises an igniter composition.

Claim 34 is further allowable because Drakin does not teach or suggest that the igniter composition and the gas generant are compressed together in the at least one pellet.

Claim 37 is further allowable because Drakin does not teach or suggest that the gas generant is formulated to produce less than an Immediately Harmful to Life or Health

concentration of ammonia, carbon monoxide, carbon dioxide, or nitrogen oxides and less than 1 percent of an original weight of the gas generant in particulates or smoke.

Claim 39 is further allowable for the reasons previously discussed for claim 8.

Claim 41 is further allowable because Drakin does not teach or suggest that the at least one solid combustion product produced by combustion of the gas generant is a slag.

Claim 42 is further allowable because Drakin does not teach or suggest that the slag is present on a surface of the at least one pellet.

Claim 53 is further allowable because Drakin does not teach or suggest that the fire suppression system is configured to disperse the inert gas mixture therefrom within from approximately 20 seconds to approximately 60 seconds after ignition of the gas generant.

Obviousness Rejection Based on Drakin in view of Ludwig

Claim 43 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Drakin in view of Ludwig. Applicants respectfully traverse this rejection, as hereinafter set forth.

Claim 43 is allowable, *inter alia*, as depending from an allowable base claim and for substantially the same reasons as discussed above for claim 11.

Obviousness Rejection Based on Drakin in view of Lundstrom

Claim 44 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Drakin in view of Lundstrom. Applicants respectfully traverse this rejection, as hereinafter set forth.

Claim 44 is allowable, *inter alia*, as depending from an allowable base claim and for substantially the same reasons as previously discussed for claim 12.

Obviousness Rejection Based on Drakin in view of Taylor and Moore

Claim 46 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Drakin in view of Taylor and Moore. Applicants respectfully traverse this rejection, as hereinafter set forth.

Claim 46 is allowable, *inter alia*, as depending from an allowable base claim and for substantially the same reasons as previously discussed for claim 15.

Obviousness Rejection Based on Drakin in view of Taylor and Hinshaw

Claim 47 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Drakin in view of Taylor and Hinshaw. Applicants respectfully traverse this rejection, as hereinafter set forth.

Claim 47 is allowable, *inter alia*, as depending from an allowable base claim and for substantially the same reasons as previously discussed for claim 16.

Obviousness Rejection Based on Drakin in view of Knowlton

Claims 50-52 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Drakin in view of Knowlton. Applicants respectfully traverse this rejection, as hereinafter set forth.

Claims 50-52 are allowable, *inter alia*, as depending from an allowable base claim and for substantially the same reasons as previously discussed for claims 19-21.

Obviousness Rejection Based on Ludwig in view of Lundstrom

Claims 57-65 and 72-82 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Ludwig in view of Lundstrom. Applicants respectfully traverse this rejection, as hereinafter set forth.

Ludwig teaches an inflator that includes a gas generating composition. Ludwig at column 8, lines 26-43. The gas generating composition includes guanidine nitrate, ammonium perchlorate, and sodium nitrate. *Id.* The guanidine nitrate is present in the gas generating composition at more than 50%. *Id.* at column 8, lines 26-43. Gas produced by combustion of the gas generating composition is used to inflate an airbag. *Id.* at the Abstract.

Lundstrom teaches a gas generant composition that includes a reaction product of aminoguanidine nitrate and nitric acid. Lundstrom at column 2, lines 60-63. CO₂ and H₂O are produced upon combustion. *Id.* at Table 1.

The obviousness rejection of claims 57-65 and 72-82 is improper because the cited references do not teach or suggest all of the limitations of claim 57.

Specifically, Ludwig and Lundstrom, when combined, do not teach or suggest the limitation of “igniting a gas generant to produce an inert gas mixture substantially free of carbon-

containing gases and comprising minimal amounts of particulates or smoke when combusted.” Ludwig does not teach or suggest the above-mentioned limitation because the amount of guanidine nitrate present in its gas generating composition results in carbon-containing gases being produced upon combustion. Lundstrom also does not teach or suggest this limitation because CO₂ is produced upon combustion of its gas generant composition.

Obviousness Rejection Based on Ludwig in view of Lundstrom and further in view of Knowlton

Claims 66-69 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Ludwig in view of Lundstrom as applied to claim 65 above, and further in view of Knowlton. Claim 68 has been canceled, rendering moot the rejection as to this claim. Applicants respectfully traverse the rejection as to claims 66, 67, and 69, as hereinafter set forth.

Dependent claims 66, 67, and 69 are allowable, *inter alia*, as depending from an allowable base claim.

Obviousness Rejection Based on Ludwig in view of Lundstrom and further in view of Taylor and Hinshaw

Claims 70 and 71 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Ludwig in view of Lundstrom and further in view of Taylor and Hinshaw. Applicants respectfully traverse this rejection, as hereinafter set forth.

Dependent claims 70 and 71 are allowable, *inter alia*, as depending from an allowable base claim and for substantially the same reasons as discussed above for claims 15 and 16.

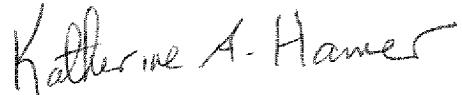
ENTRY OF AMENDMENTS

The amendments to claims 35, 39, 57, 59, 60, 63, 70, 71, and 87-90 and new claims 94-114 should be entered by the Examiner because the amendments are supported by the as-filed specification and drawings and do not add new matter to the application.

CONCLUSION

Claims 1-16, 18-90, and 94-114 are believed to be in condition for allowance, and an early notice thereof is respectfully solicited. Should the Examiner determine that additional issues remain which might be resolved by a telephone conference, the Examiner is respectfully invited to contact Applicants' undersigned attorney.

Respectfully submitted,



Katherine A. Hamer
Registration No. 47,628
Attorney for Applicants
TRASKBRITT
P.O. Box 2550
Salt Lake City, Utah 84110-2550
Telephone: 801-532-1922

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